

What is claimed is:

1. A making method of an optical waveguide substrate comprising a step of exposing a silicon substrate to an atmosphere of oxidizing gas while heating to form a quartz film on the surface thereof for an optical waveguide, characterized in that a density of Oxygen contained in said silicon substrate is 24 ppma at maximum.
2. The making method according to claim 1, wherein said silicon substrate is made by cutting a silicon monocrystal obtained with Floating Zone method.
3. An apparatus for manufacturing an optical waveguide substrate comprising a furnace core tube, for mounting a silicon substrate to be oxidized and form a quartz film on the surface thereof, of which exterior circumference is surrounded with a heating furnace, to which a pipe for supplying oxidizing gas and an exhaust pipe are connected, characterized in that said gas supply pipe is connected to a vaporizer for evaporating hydrogen peroxide water.
4. The apparatus according to claim 3, wherein the vaporizer comprises a heating device for heating hydrogen peroxide water therein.
5. The apparatus according to claim 4, wherein the vaporizer connects through a supplemental pipe to a tank contained

hydrogen peroxide water.

6. A making method of the optical waveguide substrate comprising a step of mounting a silicon substrate inside a furnace core tube arranged with a heating furnace on its exterior circumference, and then a step for heating by the heating furnace while supplying oxidizing gas evaporated from hydrogen peroxide water into the furnace core tube to thus oxidize the surface of the silicon substrate and to form a quartz film thereon.
7. The making method according to claim 6, wherein said oxidizing gas is evaporated from hydrogen peroxide by heating.
8. The making method according to claim 7, wherein said heating is at a temperature of 110 to 150°C.